

Claims

1. A method of manufacturing a fibre mat adapted for use in the manufacture of a fibre-reinforced device, said fibre mat comprising at least two essentially
5 longitudinally extending and parallel batches of fibres, wherein the method comprises that the batches are joined by holder means that span each batch in such a manner that the holder means impart an influence to each batch which influence is essentially symmetrical about an axis situated longitudinally between the batches.
- 10 2. A method according to claim 1, wherein the holder means comprise at least one thread which is conveyed in a predetermined pattern above at least one of the batches.
- 15 3. A method according to claims 1-2, wherein the holder means comprise at least one thread which is conveyed in a predetermined pattern below at least one of the batches.
- 20 4. A method according to one or more of claims 2-3, wherein the at least one thread is conveyed in a pattern that comprises cross-stitches.
5. A method according to one or more of claims 2-4, wherein the at least one thread is conveyed in a pattern that comprises stitches to be arranged longitudinally between the batches.
- 25 6. A method according to one or more of claims 1-5, wherein the fibre mat further comprises at least one further carrier layer; and wherein the method comprises that the batches are secured to the carrier layer with the holder means.

7. A method according to one or more of claims 2-6, wherein the thread is conveyed in stitches that have a length corresponding to one through ten times the width of a neighbouring batch.

5 8. A method according to one or more of claims 2-7, wherein means are provided for handling a number of threads and means for handling a carrier layer and a number of fibres; and wherein the major part of the batches are secured by the steps of:

- 10 a) a number of needles, each having a needle eyelet, being at a set of first positions between the batches conveyed through the carrier layer from a side located opposite the batches;
- b) at least two threads being seized by each eyelet;
- c) the eyelets being closed
- 15 d) the needles being pulled through the carrier layer such that the at least two threads form a loop;
- e) the eyelets being opened, and the threads being let go;
- f) each needle being conveyed through the loop that was formed in step d) of the at least two threads;
- 20 g) the needles at a set of offset positions being conveyed through the carrier layer;
- h) at least two other threads being seized by the eyelet;
- i) the needles being pulled through the carrier layer such that the at least two threads form a loop;

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wherein each of the at least two threads are, prior to step b), conveyed from opposite sides above or below a neighbouring batch of fibres.

9. A method according to one or more of claims 2-7, wherein means are
30 provided for handling a number of threads and means for handling a carrier

layer and a number of fibre batches, and wherein the majority of the batches are secured in the steps of:

- 5 j) a number of needles, each having a needle eyelet, being at a set of first positions between the batches conveyed through the carrier layer from a side located opposite the batches;
 - k) at least two threads being seized by each eyelet;
 - l) the eyelets being closed
 - m) the needles being pulled through the carrier layer such that the at least
10 two threads form a loop;
 - n) the eyelets being opened, and the threads being let go;
 - o) each needle being conveyed through the loop that was formed in step m) of the at least two threads;
 - p) the needles at a set of offset positions on the carrier layer being
15 conveyed through the carrier layer;
 - q) at least one thread being seized by the eyelet;
 - r) the needles being pulled through the carrier layer such that the at least one thread forms a loop;
- 20 wherein each of the at least two threads are, prior to step k), conveyed in a pre-determined pattern, including preferably from opposite sides above or below, respectively, a neighbouring batch of fibres and longitudinally between a first and a second neighbouring batch.
- 25 10. A method according to claim 6, wherein the holder means comprise a second carrier layer that is secured to the first carrier layer by at least three joints or rows of joints that extend in parallel, whereby the first and second carrier layers with the joints form a number of ducts in which the batches are arranged.

11. A method according to claim 10, wherein the joints or rows of joints are configured by a process selected from a group comprising stitching, gluing and welding.

5 12. A method according to one or more of claims 6-11, wherein the first carrier layer is selected from a group comprising a material which is permeable to resin, including in the form of fibres placed diagonally or transversally in relation to batches of fibres, a non-woven material, braided fibres and woven fibres, including glass fibres.

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13. A method according to one or more of claims 1-9, wherein the threads are conveyed with a tensile force adapted such that a rounded contour is imparted to the batches in the transverse direction.

15 14. A method according to claim 10 or 11, wherein the amount of fibres in the batches are adapted in relation to the size of the ducts to the effect that a rounded contour is imparted to the batches in the transverse direction.

20 15. A method according to one or more of claims 1-14, wherein the batches comprise fibres selected from among a group comprising glass fibres, carbon fibres, fibres that possess less electrical resistance than glass fibres, and combinations of fibres of different materials.

25 16. A fibre mat adapted for use in the manufacture of a fibre-reinforced device, which fibre mat comprises at least two essentially longitudinally extending and parallel batches of fibres, where the batches are joined by holder means that span each batch, whereby an influence is imparted to each batch, said influence being essentially symmetrical about an axis situated longitudinally between the batches.

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17. A fibre mat according to claim 16, wherein the holder means comprise at least one thread which is conveyed in a predetermined pattern above at least one of the batches.
- 5 18. A fibre mat according to claims 16-17, wherein the holder means comprise at least one thread which is conveyed in a predetermined pattern below at least one of the batches.
- 10 19. A fibre mat according to one or more of claims 17-18, wherein the at least one thread is conveyed in a pattern that comprises cross-stitches.
20. A fibre mat according to one or more of claims 17-19, wherein the at least one thread is conveyed in a pattern that comprises stitches that are arranged longitudinally between the batches.
- 15 21. A fibre mat according to one or more of claims 16-20, wherein the fibre mat further comprises at least a first carrier layer; and comprises that the batches are secured to the carrier layer by the holder means.
- 20 22. A fibre mat according to one or more of claims 17-21, wherein the thread is conveyed in stitches that have a length corresponding to one through ten times the width of a neighbouring batch.
- 25 23. A fibre mat according to claim 16, wherein the holder means comprises a second carrier layer which is secured to the first carrier layer by at least three joints or rows of joints that extend in parallel, whereby the first and the second carrier layer with the joints form a number of ducts in which the batches are arranged.

24. A fibre mat according to claim 23, wherein the joints or rows of joints are configured in a process selected from a group comprising stitching, gluing and welding.

- 5 25. A fibre mat according to one or more of claims 16-24, wherein the first carrier layer is selected from a group comprising a material which is permeable to resin, including in the form of fibres arranged diagonally or transversally in relation to batches of fibres, a non-woven material, braided fibres and woven fibres, including glass fibres.

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26. A fibre mat according to one or more of claims 16-25, wherein the batches comprise fibres selected from a group comprising glass fibres, carbon fibres, fibres that possess less electrical resistance than glass fibres and combinations of fibres of various materials.

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27. Use of a fibre mat according to one or more of claims 16-26, wherein the use comprises VARTM moulding of a fibre-reinforced device.

28. Use according to claim 27, wherein a device is moulded that is configured
20 for being a constituent in/of a blade for a wind energy plant.